On page 18, line 3, before "yielding" please insert --(not shown)--.

On page 18, line 3, please delete "130."

On page 18, line 4, please delete "light" and insert therefor --radiation 120--.

On page 19, line 5, please delete "aperatures" and insert therefor --apertures--.

On page 20, line 3, please delete "aperatures" and insert therefor --apertures--.

On page 20, line 5, please delete "aperatures" and insert therefor --apertures--.

On page 35, line 20, please delete "445" and insert therefor --449--.

On page 40, line 1, please delete "ensures" and insert therefor --ensure--.

On page 45, line 16, please delete "the transition is" and insert therefor --their difference is--.

On page 46, line 25, please delete "[I_{XC}(480),I_{CO}(480)]" and insert therefor --

A3 [$I_{XC}(480)^C$,$I_{CO}(480)^C$]--.

On page 52, line 27, please delete "tissue have" and insert therefor --tissue has--.

On page 57, line 5, please delete "usefl" and insert therefor --useful--.

On page 57, line 5, please delete "classifiation" and insert therefor --classification --.

On page 57, line 20, "please delete "can said in" and insert therefor --can aid in--.

In the Abstract of the Disclosure, please delete the first paragraph and amend the second paragraph as follows:

At line 1, please delete "LIFAS" and insert therefor --Laser Induced Fluorescence

A4 Attenuation Spectroscopy (LIFAS)--. And, please incorporate the third paragraph into the second paragraph.

IN THE CLAIMS:

Please cancel claims 43-47 of Group II from further consideration in the instant application. As for the remaining pending claims, please amend claims 8, 32, 33, 35, 40 , 42, 49, 51-54 and 56 as follows:

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30 ~~8~~. (Amended) [The method of claim 1] A spectroscopic method of analyzing a sample, comprising:

irradiating a sample with radiation to produce return radiation from the sample, wherein the return radiation is modulated by the sample;

A5

monitoring a first portion of the modulated return radiation at a first distance from the sample;

monitoring a second portion of the modulated return radiation at a second distance from the sample;

processing the first and second portions of the modulated return radiation to determine a modulation characteristic of the sample ,

wherein the return radiation is modulated by attenuation.

23. ~~32~~. (Amended) The method claim of [29] 21 ~~30~~, wherein the method further includes determining a physiological property of the biological material using the modulation characteristic.

A6

25 ~~33~~. (Amended) The method of claim [30] 22 ~~31~~, wherein the method further includes determining a physiological property of the living tissue using the modulation characteristic.

37 ~~36~~. (Amended) [The method of claim 33,] A spectroscopic method of analyzing a sample, comprising:

A7

irradiating a sample with radiation to produce return radiation from the sample, wherein the return radiation is modulated by the sample;

monitoring a first portion of the modulated return radiation at a first distance from the sample;

monitoring a second portion of the modulated return radiation at a second distance from the sample;

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A7 end

processing the first and second portions of the modulated return radiation to determine a modulation characteristic of the sample;

wherein the sample is biological material;

wherein the method further includes determining a physiological property of the tissue using the modulation characteristic; and

wherein the physiological property of the tissue is hypoxia.

A8

39 ~~40~~. (Amended) [The method of claim 39,] A spectroscopic method for determining the oxygenation of a biological material, comprising:

irradiating a sample of a biological material with radiation to produce return radiation from the sample, wherein the return radiation is modulated by attenuation of the sample;

monitoring a first portion of the modulated return radiation at a first distance from the sample;

monitoring a second portion of the modulated return radiation at a second distance from the sample;

processing the first and second portions of the modulated return radiation to determine the attenuation of the sample;

determining oxygenation of the sample using the attenuation of the sample;

wherein the oxygenation of the sample is determined by comparing the attenuation of the sample to the attenuation of a sample having a known level of oxygenation.

A9

41 ~~42~~. (Amended) A spectroscopic method for determining the concentration of hemoglobin in a biological material, comprising:

irradiating a sample of a biological material with radiation to produce return radiation from the sample, wherein the return radiation is modulated by attenuation of the sample;

monitoring a first portion of the modulated return radiation at a first distance from the sample;

the sample;

monitoring a second portion of the modulated return radiation at a second distance from the sample;

determining the concentration hemoglobin in the sample using the attenuation of the sample;

A9 cond

wherein the concentration of hemoglobin is determined by comparing the attenuation of the sample to the attenuation of a sample having a known concentration of hemoglobin.

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43 ~~49~~. (Amended) [The method of claim 48,] A method for determining a physiological characteristic of a biological material, comprising:

A10

irradiating a sample of a biological material with radiation to produce return radiation from the sample, wherein the return radiation is modulated by the sample;

monitoring a first portion of the modulated return radiation at a first distance from the sample;

monitoring a second portion of the modulated return radiation at a second distance from the sample;

processing the first and second portions of the modulated return radiation, using a predictive model, to determine a physiological characteristic of the sample;

wherein the predictive model is a multivariate linear regression.

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45 ~~51~~. (Amended) [The method of claim 48,] A method for determining a physiological characteristic of a biological material, comprising:

A11

irradiating a sample of a biological material with radiation to produce return radiation from the sample, wherein the return radiation is modulated by the sample;

monitoring a first portion of the modulated return radiation at a first distance from the sample;

monitoring a second portion of the modulated return radiation at a second distance from the sample;

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processing the first and second portions of the modulated return radiation, using a predictive model, to determine a physiological characteristic of the sample;

wherein the predictive model is a multicriteria associative memory classifier.

Sub B8>

52. (Amended) Apparatus for analyzing a sample, comprising:

a source adapted to emit radiation that is directed at a sample to produce return radiation from the sample, wherein the return radiation is modulated by the sample;

a first sensor[, displaced by a first distance from the sample,] adapted to monitor the return radiation at a first distance from the sample and generate a first signal indicative of the intensity of the return radiation;

All cont.

a second sensor[, displaced by a second distance from the sample volume,] adapted to monitor the return radiation at a second distance from the sample and generate a second signal indicative of the intensity of the return radiation; and

a processor associated with the first sensor and the second sensor and adapted to process the first and second signals to determine a modulation characteristic of the sample.

53. (Amended) Apparatus for analyzing a sample, comprising:

a source adapted to emit radiation that is directed at a sample volume in a sample to produce return light from the sample volume;

a first sensor[, displaced by a first distance from the sample volume] adapted to monitor the return light at a first distance from the sample volume and generate a first signal indicative of the intensity of the return light; [and]

a second sensor[, displaced by a second distance from the sample volume] adapted to monitor the return light at a second distance from the sample volume and generate a second signal indicative of the intensity of the return light; and

a processor associated with the first sensor and the second sensor and adapted to process the first and second signals to determine a modulation characteristic of the sample.

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54. (Amended) Apparatus for determining a modulation characteristic of a biological material, comprising:

a source adapted to emit excitation light;

a first waveguide disposed a first distance from the sample adapted to transmit the excitation light from the light source to the biological material to cause the biological material to produce return light and adapted to collect a first portion of the return light, such return light including fluorescence of the biological matter;

A11 end

a first sensor, associated with the first waveguide, adapted to measure the intensity of the first portion of the return light and generate a first signal indicative of the intensity of the first portion of the return light;

a second waveguide disposed at a second distance from the sample adapted to collect a second portion of the return light;

a second sensor, associated with the first waveguide, adapted to measure the intensity of the second portion of the return light and generate a second signal indicative of the intensity of the second portion of the return light;

a processor adapted to process the first and second signals to determine a modulation characteristic of the biological material.

Sub B8>

56. (Amended) Apparatus for determining a physiological property of biological material, comprising:

a source adapted to emit excitation light;

A12

a first waveguide disposed a first distance from the sample adapted to transmit the excitation light from the light source to the biological material to cause the biological material to produce return light and adapted to collect a first portion of the return light, such return light including fluorescence of the biological material;

a first sensor, associated with the first waveguide, for measuring the intensity of the first portion of the return light and generating a first signal indicative of the intensity of the first portion;

a second waveguide disposed at a second distance from the sample adapted to collect a second portion of the return light;

a second sensor, associated with the first waveguide, for measuring the intensity of the second portion of the return light and generating a second signal indicative of the intensity of the second portion;

A17 end

a processor adapted to process the first and second signals to determine a physiological property of the biological material.

Please add new claims 57-60:

-- 229 ~~57~~. The method of claim 1, wherein either but not both of the distances is substantially zero.--

Sub B9

58. The apparatus of claim 52, wherein fiber optics transmit the return radiation to the sensors.--

AB

-- 59. A spectroscopic method of analyzing a sample, comprising:

irradiating a sample with radiation to produce return radiation from the sample, wherein the return radiation is modulated by the sample;

monitoring a first portion of the modulated return radiation at a first distance from the sample;

monitoring a second portion of the modulated return radiation at a second distance from the sample;

processing the first and second portions of the modulated return radiation to determine a modulation characteristic of the sample;

wherein the sample is biological material;

wherein the method further includes determining a physiological property of the tissue using the modulation characteristic; and

wherein the physiological property of the tissue is ischemia.--

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